

PRELIMINARY NOTE ON THE BRAINS OF NATIVES OF THE ANDAMAN AND NICOBAR ISLANDS.

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Physical anthropology, or comparative human morphology, has been largely based upon cranial configuration. Since the days of Camper and Blumenbach, the classification of the human races is based on more comprehensive morphologic foundations, for with cranial morphology as the first criterion, there have been added criteria derived from the entire skeleton, the soft tissues and the brain. The last-mentioned organ has been the least studied because it is usually most difficult to obtain, preserve and study. Nevertheless, interest in this subject is manifestly increasing among anatomists and anthropologists, for they appreciate the fact that there is a pressing need for fruitful research in anthropologic encephalometry among the exotic races, so rapidly becoming impure or even extinct. Many American Indian tribes have disappeared; the volcanic outbreak in Martinique has wiped out nearly all Caribs. The Australian natives driven to the desiccated wastes of the interior, many African tribes succumbing in the arid deserts, the Eskimos decimated by epidemics of small-pox, measles and pneumonia—all these and many others are dying out and warn us to make haste in recording observations upon them while they still exist.

It has been my good fortune to pursue comparative studies in cerebral morphology based upon the brains of the white race, of Eskimos, Japanese, Chinese, Negroes and Papuans. I am now able to add the brain of a native of the Andaman Islands and one of a native of the Nicobar Islands. For this exceptional privilege I am indebted to the efforts of Dr. W. W. Keen, whose correspondence with Lord Curzon, then Viceroy of India, opened the way to communication with Mr. H. H. Risley, Director of Ethnography for India; Mr. W. R. H. Merk, Superintendent of Port Blair, and Major

A. R. S. Anderson (M. B. Cantab.) I.M.S., senior medical officer at Port Blair, Andamans. To all these I desire to acknowledge here-with my thanks.

The Andaman Archipelago is a group of densely wooded islands about 1,760 square miles in area, situated in the Bay of Bengal about 180 miles southwest of Cape Negrais, Burma, and about 60 miles distant from the more southerly Nicobar Islands. The inhabitants have been considered a most primitive and savage race. Accounts of their cannibalism are found in the ancient Chinese writings and the Andamanese are probably referred to by Ptolemy as the "anthrophagi." Port Blair is a convict settlement and the convicts are deterred from making efforts to escape by their fear of the natives. From the observations of E. H. Man, who, more than any other, has made the race a study, it appears that the Andamanese are Negritos and not Papuans. They are well made and well proportioned. Their skulls are brachycephalic. Their lips are not thick, their profiles are good and they have no peculiar odor like that which is found in the African race. Their extremities are small, but the heel projects slightly to the rear. The average height of the men is 149 cm., of the women 140 cm. The average weight of the men is 98 and 93 pounds respectively. The color of the Andamanese is generally dark bronze or copper color; often the color of soot and even quite black. The hair is woolly, but its cross-section is not always elliptical. In a letter to the Smithsonian Institution, Dr. Abbott says of them: "They are a happy, merry, little people, infantile both in looks and behavior. Unfortunately they are dying out. Contact with civilization is making the women barren and there are comparatively few children."

Mr. Man thinks that it has been pretty well demonstrated that these Negritos in the Andaman Archipelago, so unlike any of their immediate neighbors, are aborigines and have inhabited the group from prehistoric times. The population in 1901, Dr. Anderson writes me, was 2,200, including women and children.

The Andamanese wear no clothing; its place is taken in a measure by necklaces, circlets for the head, garters, bracelets and belts. They live in thatched huts and sleep on mats. Stones are used as anvil and hammer, clam shells as knives. They fashion old barrel

hoops from wrecked ships into jagged knives. The only thing resembling a musical instrument is a wooden shield-like drum upon which the performer keeps time by striking it with his foot. They make some pottery; the base of the pot is in the form of a cup. To this roll after roll is added and the sides built up, the inner and outer surfaces are smoothed off with an arca shell and ornamented with wavy, checkered or striped designs by means of a pointed stick and baked by placing pieces of burning wood both inside and around the vessel. They make cane baskets, wooden trays and buckets. String is made from vegetable fiber (orchid and *Anadendron*) and used in making harpoon lines, turtle nets, fishing nets, bowstrings coated with wax, lashings, reticules and necklaces. Bows and arrows, harpoons and fish spears are used in hunting. They build outrigger canoes and simple dugouts which are propelled by paddles, or, in shallow water, by poles or the shaft of a turtle harpoon.

Morphologically, the Andamanese form a definite group. The following criteria are given by Duckworth:¹

Cranial index	82.1
Alveolar index	102.0
Nasal index	50.9
Height index	77.9
Cranial capacity	1,266 c.c.

The skull is small and round, with prominent jaws. It is cryptozygous, muscular ridges are not very prominent, the mastoid processes are small, and the external auditory meatus is shallow. Brow-ridges are not developed, and sexual differences are often obscure in these skulls. The face is prognathous, the prognathism affecting chiefly the alveolar maxillary margin and being therefore subnasal. The chief distinction is the association of a highly brachycephalic skull of small capacity with dwarf stature and prognathism. The lumbo-vertebral index denotes simian affinities. The sacral curve is very slight, indicating a low position among hominidæ. The scapula is the most pithecoïd amongst hominidæ with the possible exception of the Bambuté dwarfs of Africa. The proportions of the limb-bones are simian as regards the radio-humeral and the tibio-femoral, but not as regards the intermembral of humero-femoral indices.

¹ Duckworth: "Morphology and Anthropology," Cambridge Biological Series, 1904.

THE BRAIN.

[Preliminary Report.]

The brain is that of an Andamanese named Juran of the tribe called Aka-yere or Aka-Jaro-da. Juran was a male, aged about 45 years, who died at Port Blair of pulmonary tuberculosis on June 30, 1905. The brain was removed by Dr. Anderson about one hour after death and immersed in a mixture of formalin and water. Its



FIG. 1. Brain of Andamanese (dorsal view).

weight while fresh was not noted before being sealed and transported. When received about eight months later it weighed 1,193 grams, as follows:

	GRAMS.
Left hemicerebrum	532
Right hemicerebrum	525
Cerebellum, pons and oblongata.....	136
Total	1,193

The specimen continued to lose weight slightly and in April, 1908, after removal of the cerebral pia-arachnoid, weighed as follows:

	GRAMS.
Left hemicerebrum	493
Right hemicerebrum	490
Cerebellum, pons and oblongata.....	130
Total	1,113

Various calculations indicate that the fresh weight of this brain was probably between 1,200 and 1,250 grams.

The brain is broad and short.² The frontal lobes are less massive than in whites. The fissuration is well marked but not very complex. The precallosal length is less than in whites. The callosum is of good size, comparing well with those of whites. The calcarine fissure is interrupted on the left side. The fissural peculiarities must be considered more fully in the final publication, and, if possible, should be based upon comparison with more specimens from natives of this race. The following dimensions may be recorded here:

	CENTESIMALS.
Brain-length, left half.....	16.1
Brain-length, right half.....	15.8
Brain-width	13.9
Cerebral index	86.9
Horizontal circumference	47.0
Width, left hemicerebrum.....	6.9
Width, right hemicerebrum.....	7.0
Left occipito-temporal length	12.6
Right occipito-temporal length	12.4
Length of callosum	7.3
Percentage of callosal length.....	45.3%
Left centro-temporal height	10.6
Right centro-temporal height	10.6
Left centro-olfactory height	8.7
Right centro-olfactory height	8.7

ARC MEASURES.

Left	{ Frontal	14.5
	{ Parietal	5.0
	{ Occipital	5.5
Right	{ Frontal	14.5
	{ Parietal	4.5
	{ Occipital	6.0

CEREBRAL INDICES.

Left	{ Frontal	58.0
	{ Parietal	20.0
	{ Occipital	22.0
Right	{ Frontal	58.0
	{ Parietal	18.0
	{ Occipital	24.0

² It was somewhat flattened upon its dorsum during transportation.

HORIZONTAL DISTANCES (IN CENTESIMALS).

FROM FRONTAL POINT TO:

Left Lateral Aspect	{	1. Tip of temporal lobe.....	23.0
		2. Sylvian-presylvian junction	31.0
		3. Ventral end of central fissure.....	44.1
		4. Sylvian-episylvian junction	62.1
Left Mesal Aspect	{	6. Frontal edge of callosum.....	22.3
		7. Porta (Foramen of Monro).....	42.2
		8. Dorsal end of central fissure.....	64.6
		9. Dorsal intersection of paracentral fissure.....	71.4
		10. Caudal edge of callosum.....	67.9
		11. Occipito-calcarine junction	78.2
Right Lateral Aspect	{	12. Dorsal intersection of occipital fissure.....	88.2
		1. Tip of temporal lobe.....	21.8
		2. Sylvian-presylvian junction	31.4
		3. Ventral end of central fissure.....	46.8
Right Mesal Aspect	{	4. Sylvian-episylvian junction	63.4
		6. Frontal edge of callosum.....	20.5
		7. Porta (Foramen and Monro).....	41.6
		8. Dorsal end of central fissure.....	70.5
		9. Dorsal intersection of paracentral fissure.....	77.0
		10. Caudal edge of callosum.....	67.3
	{	11. Occipito-calcarine junction	76.2
		12. Dorsal intersection of occipital fissure.....	91.6
Cross-section area of callosum = 5.85 sq. ctm.			

NICOBARESE BRAIN.

With regard to the ethnic position of the Nicobarese there exists considerable doubt. They are very different from the Andamanese. Their color is a light brown, the hair is straight and black, and apparently they are of ancient Mongolian origin with probably no admixture of Papuan or Negrito elements. Their stature is medium (158-163 cm.), not small as are the Andamanese.

The brain is that of an individual from Kar Nicobar, a male, aged 25, who died of hypertrophic cirrhosis of the liver and fatty degeneration of the heart in the hospital at Port Blair. The brain weighed 49 ounces avoirdupois or 1,389 grams. The body-weight was 136.5 pounds, while the stature was 170 cm.

Major Anderson injected about 10 c.c. of 5 per cent. formaldehyde into the ventricles through the tuber and immersed the brain in the same mixture. The specimen reached me in March, 1906, a little over three months after its removal from the head.

Its present weight, divested of the cerebral pia-arachnoid, is 1,257 grams. The brain is somewhat flattened and elongated. The fissural pattern is fairly good but not as complex as in the average



FIG. 2. Brain of Nicobarese (dorsal view).

white brain. The calcarine fissure is interrupted on both sides, the interruption being somewhat concealed on the left side. The callosum is small, a fraction over 5 sq. cm. The indusium, however, is quite massive, and further study of rhinencephalic parts may prove interesting. The insula is slightly visible on both sides.

The measurements of this specimen are as follows:

	CENTESIMALS.
Brain-length, left	19.1
Brain-length, right	18.5
Brain-width	13.3
Cerebral index	70.0
Horizontal circumference	52.0
Width, left hemicerebrum	6.9
Width, right hemicerebrum	6.4
Left occipito-temporal lobe	14.3
Right occipito-temporal lobe	14.2
Length of callosum	8.5

Percentage of callosal length.....	44.7%
Left centro-temporal height	9.2
Right centro-temporal height	8.7
Left centro-olfactory height	8.2
Right centro-olfactory height	8.0

ARC MEASURES.

Left	{ Frontal	16.0
	{ Parietal	4.5
	{ Occipital	5.5
Right	{ Frontal	16.5
	{ Parietal	5.0
	{ Occipital	5.0

CEREBRAL INDICES.

Left	{ Frontal	61.5
	{ Parietal	17.3
	{ Occipital	21.2
Right	{ Frontal	62.3
	{ Parietal	18.8
	{ Occipital	18.8

HORIZONTAL DISTANCES (IN CENTESIMALS).

FROM FRONTAL POINT TO:

Left Lateral Aspect	{	1. Tip of temporal lobe.....	25.1
		2. Sylvian-presylvian junction	30.3
		3. Ventral end of central fissure.....	41.8
		4. Sylvian-episylvian junction	?
Left Mesal Aspect	{	6. Frontal edge of callosum.....	20.0
		7. Porta (Foramen of Monro).....	38.2
		8. Dorsal end of central fissure.....	—
		9. Dorsal intersection of paracentral fissure.....	65.4
		10. Caudal edge of callosum.....	64.4
Right Lateral Aspect	{	11. Occipito-calcarine junction	81.1
		12. Dorsal intersection of occipital fissure.....	83.2
	{	1. Tip of temporal lobe.....	24.6
		2. Sylvian-presylvian junction	28.2
Right Mesal Aspect		3. Ventral end of central fissure.....	41.3
		4. Sylvian episylvian junction	55.0
	{	6. Frontal edge of callosum.....	18.3
		7. Porta (Foramen of Monro).....	37.7
		8. Dorsal end of central fissure.....	61.2
		9. Dorsal intersection of paracentral fissure.....	63.8
		10. Caudal edge of callosum.....	63.8
		11. Occipito-calcarine junction	75.4
		12. Dorsal intersection of occipital fissure.....	87.4

Cross-section area of callosum = 5.02 sq. ctm.

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